November 5, 2008
Informal Public Review

# October 30, 2008
# SB 1575 Water Adequacy Rule Modification
# Informal Public Comments and
# Department Responses

## I. Introduction

The Department initiated a series of workshops around the state beginning in the spring of 2007 to explain to interested parties (cities, towns, counties, the development community, and the general public) the scope and impact of SB 1575 as enacted by the Arizona State Legislature.

Beginning in February 2008, the Department initiated a series of stakeholder meetings to present draft rule concepts and language as mandated by SB 1575. A total of 23 informal public meetings were held presenting the draft rules and seeking public comment. Included in the stakeholder meetings were three that were technical in nature and attended primarily by hydrologic professionals representing municipal water system operators, hydrologic consultants, and representatives of the United States Geological Survey (USGS). The focus of the technical meetings was to review the current known status of hydrologic conditions within the state and formulate recommendations on standards for determining physical availability of groundwater. While the remainder of the public stakeholder meetings included hydrologic discussions, they focused primarily on the administrative and legal aspects of the proposed rule package.

The Department requested that written comments on the draft rules be submitted by the stakeholder group in August of 2008. The Department received multiple comments from various parties involved in the stakeholder process. Of the 8 comments received, four, which were strictly technical in nature, were received in May and August of 2008 as part of the technical hydrologic review of the conditions of the C and R aquifer of the Coconino Plateau area of northern Arizona (Small, Ploughe, Hoffman, McGavock). These comments have been included since some relate to the draft rules, as well as the related Substantive Policy Statement "Hydrologic Guidelines for Determining Assured and Adequate Water Supplies."

Including the four technical responses outlined above, the Department received a total of 8 responses from various interested parties: Deb Hill, Chair, Coconino County Board of Supervisors (county staff comments were also included as an attached memo); Chip Davis, Supervisor, Yavapai County Board of Supervisors; Mike Ploughe, Town of Payson; John Hoffmann, USGS; Brad Hill, City of Flagstaff; Ed McGavock, Consultant; Gary Small, Consultant; and Maureen George, Law Offices of Maureen Rose George, P.C. All comments were made available on the Department website, and are on file for public review.

The original draft of the proposed rules included specific requirements on conducting hydrologic studies demonstrating physical availability within the C and R aquifers of Northern Arizona. A majority of the technical comments on the hydrologic study requirements agreed on three points: 1) that there was a general lack of detailed hydrologic information for most of the C and R aquifers; 2) as a result, the standards originally proposed in the draft rules were too onerous and cost prohibitive to be met by even the largest water providers in the region; and 3) the Department should allow more flexibility for site-specific conditions, allowing for the modification of the standards as the general detailed scientific knowledge of the C and R aquifers grows. The Department agreed with these observations. As such, the Department removed the specific hydrologic study requirements from the draft rule. This will allow for greater flexibility to accommodate site specific conditions, and incorporate new data as scientific knowledge of the aquifers increases. This also conforms to the current structure of the assured and adequate water supply rules. The rules provide the standard that must be met for the 100-year physical availability demonstration, and the policy statement (Substantive Policy Statement, "Hydrologic Guidelines for Determining Assured and Adequate Water Supplies") and application forms provide the detail on how the supporting documentation and information is submitted to the Department.

All comments received have been reviewed by the Department and addressed; either changes were made or the Department responded as to why the suggested changes should not or could not be made. The comments and responses are grouped by those that deal directly with the draft rules as currently proposed, and those that are related to the detailed hydrologic study requirements, which will be dealt with in the new Substantive Policy Statement, "Hydrologic Guidelines for Determining Assured and Adequate Water Supplies."

## II. Comments related to modification of the water adequacy rules under SB 1575

**Comment:** Why is the state not demanding more funding for long-term monitoring and research on hydrologic conditions? (Supervisor Chip Davis, Yavapai County Board of Directors, Deb Hill, Chair, Coconino County Board of Supervisors)

**Response:** This is a legislative funding priority question beyond the scope of this rule package.

**Comment:** Other than the initial adoption of SB 1575 are there any other provisions that require a unanimous vote? (Supervisor Chip Davis, Yavapai County Board of Directors)

**Response:** This is a provision of the statute and beyond the scope of this rule package. However, the Department's interpretation of the statute is that only the adoption of SB 1575 by a county requires a unanimous vote. Adoption of the optional

hauled water exemption or adoption of SB 1575 by a city or town requires a simple majority

**Comment:** Hauled water sources are not regulated. Could the rules require identifying and quantifying the source and require a 100-year supply? (Supervisor Chip Davis, Yavapai County Board of Directors)

**Response:** The Rules do not need to be modified to require identifying and quantifying a 100-year supply for hauled water. The statute (A.R.S. § 45-108), and the Rules require the demonstration of a 100-year adequate water supply for ALL water supplies associated with a proposed subdivision, regardless of source. However, SB 1575 specifically gave the local platting authorities (cities, towns and counties) the option of allowing the approval of subdivisions with an inadequate hauled water supply. Allowing such hauled water subdivisions is a choice the local platting entity has; it is not mandatory under the statute to allow such developments. In addition, when creating local ordinances that may allow for the hauled water developments, the local entities may place additional restrictions on the exemption as they see fit.

**Comment:** The issue of proliferation of exempt wells and lot splits are not addressed in the rule package. (Supervisor Chip Davis, Yavapai County Board of Directors, Deb Hill, Chair, Coconino County Board of Supervisors)

**Response:** These are statutory issues and are beyond the scope of this rule package.

**Comment:** Question the management of aquifers when they cross political boundaries, where one county may adopt and the adjoining may not. (Supervisor Chip Davis, Yavapai County Board of Directors)

**Response:** SB 1575 and the draft rules (R12-15-716(B)(3)(d) and (E)(2)(e)) require an applicant to estimate the projected demands and account for those demands that are likely to occur in an adjoining jurisdiction that does not adopt the adequacy requirement when determining physical availability.

**Comment:** Can we assign surface water dedicated rights to protect natural surface flows? (Supervisor Chip Davis, Yavapai County Board of Directors)

**Response:** This is a statutory provision and is beyond the scope of this rule package.

**Comment:** Long-term regional planning is needed in rural areas similar to the process currently done in the AMAs; long term regional monitoring should also be required, in support of regional modeling in rural areas, as is currently done in the AMAs. (Supervisor Chip Davis, Yavapai County Board of Directors, Deb Hill, Chair, Coconino County Board of Supervisors; Gary Small, Consultant)

**Response:** The Department agrees that long-term regional planning is needed and the Legislature has created the Rural Watershed Initiative to assist rural communities and

regions on long-term water supply planning. However, regional planning is a voluntary measure that regional communities can also implement on their own. Imposing the same reporting and monitoring requirements that exist in the AMAs to support regional modeling would require a statutory modification and is beyond the scope of this rule package. The Department does pursue regional modeling in rural areas; however, budgetary constraints hamper these efforts. This is a legislative funding priority issue and is beyond the scope of this rule package.

**Comment:** Generally supportive of rule modification proposal. (Supervisor Chip Davis, Yavapai County Board of Directors; Deb Hill, Chair, Coconino County Board of Supervisors; Gary Small, Consultant; John Hoffmann, USGS; Brad Hill, City of Flagstaff; Ed McGavock, Consultant)

**Response:** The Department appreciates the support.

**Comment:** Draft rule R12-15-713(M)(2)(d) refers to "municipal physical works" while the introductory paragraph in (M) does not require the project to be a municipal project. The discussions at SWAG and the existing language in A.R.S § 45-108.03 (as modified by SB 1575) indicate the intent was to permit the continuation of the development while the project neared completion. Suggest adding "Municipal" before "water supply project" in (M)(2)(d). (Maureen George, Law Offices of Maureen Rose George, P.C.)

**Response:** The word "municipal" was inadvertently included before "physical works." The Department has deleted "municipal" from draft rule R12-15-713(M)(2)(d).

**Comment:** Generally supportive of the concept of percent remaining in the aquifer instead of an absolute maximum depth limit in the C and R aquifers. (Brad Hill, City of Flagstaff; Gary Small, Consultant; John Hoffmann, USGS; Ed McGavock, Consultant)

**Response:** The Department appreciates the support.

**Comment:** The statutory exemption that allows approval of a subdivision which will have a supplemental water supply provided by a water infrastructure project that will be completed within 20 years lacks sufficient criteria to guarantee completion of such a project and lack sufficient enforcement provisions if it is not completed; ADWR needs additional enforcement authority. (Deb Hill, Chair, Coconino County Board of Supervisors)

**Response:** This is a statutory exemption and is therefore beyond the scope of this rule package. However, the Department disagrees. Specific financial and other requirements are in place in both the statute and rule as to require sufficient proof that the required criteria are met

**Comments:** Rules do not take into account local conditions; they should be modified to expressly state local conditions will be taken into account. (Deb Hill, Chair, Coconino County Board of Supervisors)

**Response:** The Department does not agree. The physical availability requirements, information used to determine the demands of the proposed application, and the potential supply to support the application, are completely reliant upon the site-specific information provided by the applicant. All site-specific information, such as the source of supply, site-specific geology, conservation measures, projected population, and high demand uses within the proposed project design, is unique to the specific application, and taken into account by the Department. No additional change to the rule language is warranted.

**Comment:** It is unclear what is meant by the terms "use," "study area," and "area of impact" found in R12-15-716(C)(3) and (F)(2). Definitions should be provided for these terms. (Deb Hill, Chair, Coconino County Board of Supervisors) (Note that the terms "study area" and "area of impact" are not used in the referenced subsections; however, those subsections refer to the "affected area," which the Department assumes is the phrase the commenter intended to reference.) How large does a study area have to be? (Gary Small, Consultant)

**Response:** The Department does not agree that these terms require definitions in the rules. Taken in full context under R12-15-716, an applicant must demonstrate that sufficient physical availability exists for the demands associated with the pending application, taking into account all existing uses on the same water source in the affected area. Because of the need to take into account the project specific design as well the site specific conditions of an area (see response above), it would be near impossible to define the affected area or study area universally for all applications. The Department always recommends that an applicant meet with the Department prior to initiating the hydrologic study to verify the methodology as well as the study area to be used in an application.

**Comment:** There is no clear-cut method for a developer to estimate the costs associated with proving an adequate water supply early in their planning and decision-making process. (Deb Hill, Chair, Coconino County Board of Supervisors)

**Response:** The Department agrees that assessing potential costs early in the planning process is difficult. However, the Department believes that the difficulty assessing costs before the planning process is complete, which arises from the wide variety of options in creating the water supply plan and demonstrating that it meets the adequacy criteria, is outweighed by the flexibility for the applicant. Given the multiple variables and tools available to a developer to bring a water portfolio together, the complete freedom to design a development as they see fit, and other site-specific variables such as local geology, a single, simple cost estimation is difficult to bring together. The program is intentionally designed to be open-ended to give potential developers the maximum flexibility to design their development to obtain a water adequacy determination. Given

the variability of water supplies across the state, a single, one-size-fits-all approach would not work.

**Comment:** Current online Subdivision Demand Calculator is not user friendly. (Deb Hill, Chair, Coconino County Board of Supervisors)

**Response:** This is an optional tool provided to assist the public in supplying the needed demand information to the Department and is not a part of the proposed rule package modification. The Department appreciates the observation and as a result has updated the tool to increase ease of use, and provided more detailed directions and definitions of terms to make the tool more user-friendly.

**Comment:** The draft rules do not address the future phases of existing subdivisions; suggest specifically addressing this in the rules. (Deb Hill, Chair, Coconino County Board of Supervisors)

**Response:** The Department does not agree. The existing statutory framework currently defines this process for future subdivisions and thus modification of the rules is not warranted. A new plat, regardless of whether it is a new phase of a development with a previously recorded plat, must apply for a water report, if it will not be served by a water provider designated as having an adequate water supply, prior to recordation and prior to seeking a public report. If the local jurisdiction adopts the adequacy requirement, then the new plat must obtain an adequacy finding on the water report prior to recordation and prior to seeking a public repot with the Arizona Department of Real Estate.

**Comment:** Concern over potential "banking" or "locking up" of water supplies associated with the issuance of an Analysis of Water Adequacy for subdivisions that are never built; suggest inclusion of provision similar to designations for an initial timeframe for adequacy determinations. (Deb Hill, Chair, Coconino County Board of Supervisors)

**Response:** The Department disagrees with the comment. The existing rules limit the term of an analysis (assured or adequate) to 10 years. While the rules also allow for possible extensions for the applicant, which are only granted if the applicant can demonstrate progress toward completion of the subdivision, once the term of the analysis expires the Department no longer considers the supply to be "locked up" and it then is free to be used by other applicants in the area. The Department has worked with the development community on previous rule modifications in the past (12 A.A.R. 3475, 3494, September 29, 2006) and came to a consensus. The Department believes the rule as it currently exists balances the need for long-range financial planning by the development community with the Department's desire not to unduly restrict access to water supplies for other applicants in the same area.

Due to site specific variables including site specific hydro-geology, specific demand in the application, volume of existing uses relying upon the same water supply, the number of existing lots and previous adequate determinations made by the Department, the exact

size and scope of the study area will vary greatly. The study area must be large enough to encompass the hydrologic impact of the applicant's demands also taking into account all existing demands on the same water source. Determining the exact areal extent of these compounding influences is a standard practice with hydrologic consulting professionals. The details of such studies are laid out in the Substantive Policy Statement "Hydrologic Guidelines for Determining Assured and Adequate Water Supplies."

**Comment:** Section F refers to anticipated demands in an adjoining basin but not in a mandatory adequacy area but the rule is not clear how those demands are to be assessed by the Department. (Deb Hill, Chair, Coconino County Board of Supervisors)

**Response:** SB 1575 and the proposed rule R12-15-716(B)(3)(d) and (E)(2)(e) require the applicant in a mandatory adequacy area, when demonstrating physical availability, to take into account demands of anticipated future uses that may rely upon the same water supply in other jurisdictions not requiring adequacy. While no prediction will always accurately capture all of the potential development in an area, a reasonable attempt must be made to try and predict such future demands. The applicant may rely upon any government planning entity, local planning authority or association of authorities for such predicted information. Examples of such entities include county planning and zoning divisions, a county association of governments, the Arizona Department of Economic Security, universities, etc. The Department has worked with such entities in the past and often relies on them for growth projection data. Directions for gathering acceptable information will be included in the Substantive Policy Statement "Hydrologic Guidelines for Determining Assured and Adequate Water Supplies" and on the application forms used by the Department. Contact information for such entities will also be provided in the application materials.

**Comment:** It may be impractical to determine physical availability for 100 years. Could long-term monitoring substitute to show trends instead? (Gary Small, Consultant)

**Response:** This would require a statutory change and is beyond the scope of this rule package. A.R.S. § 45-108 requires a determination of the adequacy of the water supply for 100 years.

**Comment:** Are domestic water improvement districts (DWID's) and water co-operatives (Co-Op's) considered municipal water providers under the water adequacy program? A.R.S. § 45-561- (10) defines "municipal provider" as "a city, town, private water company, or irrigation district that supplies water for non-irrigation use." Rules should be modified to include DWIDs and Co-Ops as municipal water providers. (Deb Hill, Chair, Coconino County Board of Supervisors)

**Response:** The Department disagrees. The issue raised by commenter relates to whether DWIDs are included in the definition of "municipal provider." The statutes that provide the framework for DWIDs also provide that for purposes of Title 45, DWIDS shall be treated as private water companies (and therefore as municipal providers under

the AWS rules). The Department addressed a similar comment in the September 2006 AWS rulemaking (12 A.A.R. 3475, 3494, September 29, 2006), as follows:

> Comment:
>
> Proposed rule R12-15-701(49) defines "municipal water provider" by referencing A.R.S. § 45-561. The statutory definition defines the term to include a city, town, private water company or irrigation district that provides water for non-irrigation use. Does this definition include community facilities districts? (Sheryl A. Sweeney, Ryley Carlock & Applewhite.)
>
> Response:
>
> Yes. A community facilities district established pursuant to A.R.S. §§ 48-701, et seq., "that distributes or sells groundwater is a private water company only for purposes of title 45, chapters 2 and 3.1." A.R.S. § 48-708(B). Additionally, the definition includes county improvement districts established pursuant to A.R.S. §§ 48-901, et seq., because such districts "shall have the same authority and responsibility as an incorporated city or town pursuant to the provisions of title 45." A.R.S. § 48-909(C).

The issue of defining both DWIDs and community facilities districts is clearly addressed in statute and does not need to address in the proposed rules. The issue of Co-Ops is also addressed. Co-Ops are adjudicated by the Arizona Corporation Commission to be for public service or not for public service. Since the Commission has original jurisdiction, the Department considers such water systems to be private water companies for the purposes of the assured and adequate water supply rules.

**Comment:** The Coconino Plateau lacks a regional groundwater flow model with which to start the program. While the USGS is developing its regional model, ADWR should develop other models in Northern Arizona. (Deb Hill, Chair, Coconino County Board of Supervisors)

**Response:** It is unclear if the commentator intended “start the program” to mean adoption of the draft rules, implementation of the adequacy program under A.R.S. §45-108, or adoption of the adequacy requirement by a local jurisdiction. The Department does not agree that adoption of the draft rules is reliant upon the model being developed by the USGS. The draft rules do not mandate use of such a model, and the development of such a model is beyond the scope of these rules. While such a model may assist applicants, it is not the only option available to applicants. If the Commentator intended “program” to mean the adequacy program in general, again the Department disagrees, because the program has existed under A.R.S. §45-108 and has been successfully implemented since 1973 without the existence of such a model. If the Commentator is

referring to the adoption of the water adequacy requirement, the Department disagrees. This is a local legislative decision, and beyond the scope of these rules.

**Comment:** Costs associated with proving water adequacy in an existing service area could be onerous for one subdivider who may end up having to prove adequacy for the existing system.

**Response:** The Department does not agree. Costs associated with proving water adequacy in an area that has adopted the adequacy requirement are beyond the scope of this rulemaking. The presumption of greater costs associated with a specific development within an existing service area vs. being located outside of an existing service area is incorrect. The applicant need only demonstrate the additional supply needed for its subdivision. The applicant does not need to re-prove all of the adequate water supply criteria (physical, legal, continuous, financial capability and adequate water quality) for existing connections within a providers service area. The applicant simply needs to take the existing demands into account when determining the next incremental supply needed for his application. This would be the same if the applicant were not in the service area but were proposing to draw water from the same source. In fact, the costs for an applicant outside an existing service area may be greater than the costs for an application within an existing service area due to the need for new infrastructure as well as data acquisition.

**Comment:** Use of multiple percentage of aquifer saturation to determine pumping test requirements, and use of multiple percentage of aquifer saturation remaining standards is too cumbersome. (Mike Ploughe, Town of Payson; Brad Hill, City of Flagstaff)

**Response:** The Department agrees. The new rule proposal now has a single percentage requirement for the remaining groundwater in storage criterion. The applicant must demonstrate that at least 50 percent of the groundwater in storage will remain after 100 years of groundwater withdrawals. The aquifer test requirements will be determined based upon the general guidelines found in the Substantive Policy Statement "Hydrologic Guidelines for Determining Assured and Adequate Water Supplies" and upon site-specific information, which will provide applicants with greater flexibility.

**Comment:** ADWR should adopt locally relevant well spacing rules and require groundwater management to minimize demands within an area's sub-regional "safe-yield." ADWR should consider establishing an initial estimate of safe-yield based upon existing data and then refine it as new wells and test results warrant. A link of supply and demand should be recognized via adequate water supply policy. Demands used for 100-year projections could be reined in through per capita usage targets and limits on out-door water use. Provisions for recharge of reclaimed water would be helpful. (Mike Ploughe, Town of Payson)

**Response:** This would require a statutory change and is beyond the scope of this rule package.

**Comment:** Concerns were raised regarding requiring 30-day aquifer test where such testing is not always warranted. Other concerns raised included costs associated with such long-term pumping in remote locations and public perception of wasting water where pumped water could not be used in an existing system (Brad Hill, City of Flagstaff; Mike Plough, Town of Payson; Deb Hill, Chair, Coconino County Board of Supervisors; Gary Small, Consultant)

**Response:** The Department agrees. The rules have been modified to remove the requirement for a minimum 30-day aquifer test. The method for determining pumping test requirements will be determined based upon the general guidelines found in the Substantive Policy Statement, "Hydrologic Guidelines for Determining Assured and Adequate Water Supplies," and upon site-specific information, which will provide applicants with greater flexibility. The policy statement allows for shorter duration aquifer testing and/or alternative data to be submitted in some cases.

**Comment:** ADWR should acknowledge the existence of deep aquifers in the Pine and Williams areas and that chronic water shortages in these areas occurred because of high costs for deep drilling, forcing the reliance on shallow, low yield wells that are sensitive to drought. (Mike Ploughe, Town of Payson)

**Response:** The Department recognizes the existence of deep aquifers in northern Arizona. As the commentator pointed out, the existence of such aquifers does not guarantee that a water provider or a subdivision has an adequate water supply. This is one reason the Department is proposing to modify the physical availability requirements for the C and R aquifers. However, it should be reiterated that the statute requires that all five criteria must be met, including financial capability to construct necessary infrastructure (including deep wells), legal availability of the supply, demonstration that the supply is of adequate quality, and demonstration that the supply is continuously available in addition to the supply being physically available.

**Comment:** Several comments were received concerning the remaining saturated thickness physical availability criteria. These included: original saturated thickness measured when (current conditions, pre-development, at the time of application)? If aquifer continues to decline would percent remaining continue to decline? How does percent of saturated thickness remaining relate to storage capacity? How would this relate to artesian conditions? (Brad Hill, City of Flagstaff; Mike Plough, Town of Payson; Deb Hill, Chair, Coconino County Board of Supervisors; Gary Small, Consultant, John Hoffmann, USGS; Ed McGavock, Consultant)

**Response:** The physical availability criteria for the C and R aquifers is based on 50% of the projected remaining groundwater in storage at the proposed location(s) of withdrawals as estimated by the projected remaining saturated thickness at the proposed location(s) of withdrawals that is numerically "weighted" for variations in storage properties of aquifer sub-units or sub-layers. The one-time calculation of the groundwater in storage in the aquifer will be based on the groundwater in storage as of effective date of these rules. The Department will not continue to recalculate the percentage remaining

of groundwater in storage for each application, essentially allowing the dewatering of the aquifer.

**Comment:** The Department should consider using an incremental approach of implementing the rules similar to the enactment of the assured water supply rules in the AMA's after the enactment of the groundwater code in 1980. (Brad Hill, City of Flagstaff)

**Response:** The Department disagrees. The modification of the existing water adequacy rules to accommodate the new provisions of SB 1575 is not comparable to the adoption of new rules requiring consistency with the AMA's management goal, which required (among other things) the shift of reliance from using groundwater to the use of renewable supplies. In 1980, the legislature established as a management goal for most AMAs that within 45 years, over-drafting of groundwater in the AMAs be stopped (safe-yield by 2025). No such comparable requirements are contained within SB 1575. However, the Department has proposed a new methodology for demonstrating physical availability in the Flagstaff area (Coconino Plateau) under the new rule proposal (percentage of remaining groundwater in storage) in addition to retaining the existing maximum depth criterion as an alternative. The availability of the current standard plus the ability to use the new criteria will allow a transition for applicants under the new rules, giving them maximum flexibility for their unique circumstances.

**Comment:** The draft rules appear to be written more for single subdivisions seeking a water report than for a municipality seeking a designation of water adequacy. (Brad Hill, City of Flagstaff)

**Response:** The Department disagrees. Although the majority of questions and examples of the application process were from and responses geared toward individual developers during our public meetings, the criteria for demonstrating physical availability are exactly the same for single subdivisions and for designated providers. In some instances the requirements for a provider seeking a designation of water adequacy to demonstrate continuous availability and the financial capability to construct future infrastructure are more flexible than for a singe subdivision.

**Comment:** What are the financial implications of not considering financial capability as a factor to issue variances? (Gary Small, Consultant)

**Response:** A.R.S. 45-108 and existing rules require the demonstration of sufficient financial capability to complete all necessary water infrastructure to obtain a determination of adequate water supply. The draft rule amendments in question (R12-15-716(C)) allow the Director to grant an exemption from the maximum depth to water limit for an adequacy applicant in an area other than the C and R aquifers after considering whether the groundwater is available at the greater depth, whether withdrawal of the groundwater from the lower depth will impact existing users, and whether wells have been drilled to obtain the groundwater at the greater depth. The financial capability

criterion has been replaced with a consideration of whether wells have been drilled to obtain the groundwater.

**Comment:** Our understanding is that part of the review process for the new rules involves an evaluation of costs and benefits associated with the new rules. There are significant costs associated with the proposed rules and it is still unclear to us how a developer could estimate an approximate amount for proving adequacy. (Deb Hill, Chair, Coconino County Board of Supervisors)

**Response:** The Department disagrees that the draft rule amendments impose significant costs. The commentator is correct that the Department must evaluate the costs associated with the adoption of this rule package. However, the rule modifications themselves will have minimal economic impacts. The Department recognizes, however, that legislative action on a local level (city, town or county) where the local legislative body may act to require an adequacy determination may increase costs for developers who are used to simply obtaining an inadequate determination from the Department. If this adequacy requirement should be adopted, the potential applicant may experience increased costs associated with proving the adequacy of the water supply if the developer anticipated not demonstrating an adequate supply, but the basic standards for an adequate water supply determination currently in place (i.e. without the rule modification) remain the same. It should be noted that the new hydrologic standard proposed for the C and R aquifers is optional, and the applicant may choose to use the current standard without the rule modification. The Department anticipates the new standard would be easier to meet, and thus less costly than the current standard in most areas of the C & R aquifers. The local legislative body in making this decision will undoubtedly weigh this potential impact to the development community against the economic benefit of protecting the long-term water supplies of their current and future residents.

**Comment:** Is a one-hour well test sufficient to determine whether the water supply it produces will meet the five elements of the mandatory water adequacy program? A comment was made by a local utilities director during a county work session on the proposed adequacy rules that in 99% of the cases a one-hour test on a new well is sufficient to determine the well's productivity. (Deb Hill, Chair, Coconino County Board of Supervisors)

**Response:** No. Regardless of whether the local legislative body adopts the adequacy requirement, the five criteria of the water adequacy program will remain the same: physical, legal, and continuous availability, adequate quality, and the applicant must have sufficient financial capability to complete the needed infrastructure. The local legislative body's decision to adopt or not adopt the water adequacy requirement does not modify these five standards. Test-pumping a well (or aquifer testing) is only part of the information needed to address physical availability; it does nothing to meet the other four criteria. As to the one-hour duration of said aquifer test, the Department observes that a one-hour test would hardly remove a sufficient volume of water to adequately stress the aquifer some distance from the well. A one-hour-duration test certainly is not enough to determine aquifer performance characteristics to predict available 100-year water

supplies. A review of comments submitted in response to this rule package proposal indicate that representatives of two cities in Northern Arizona (Brad Hill, City of Flagstaff; Mike Ploughe, Town of Payson), as well as Coconino County, all recommend at least a 7-day test. The Department believes that the longer an aquifer test is run the more likely the test is to reveal unknown characteristics of the aquifer. However, the Department also recognizes the balance needed in seeking aquifer data vs. costs associated with such testing. The method for determining pumping test requirements will be determined based upon the general guidelines found in the Substantive Policy Statement, "Hydrologic Guidelines for Determining Assured and Adequate Water Supplies," and upon site-specific information, which will provide applicants with greater flexibility. The policy statement allows for shorter duration aquifer testing and/or alternative data to be submitted in some cases.

## III. Technical Hydrologic Comments

The remainder of the comments received are not directly commenting upon the draft rule language, but are related to the technical requirements of hydrologic studies submitted in support of physical availability demonstrations for 100-year adequate water supply applications in the C and R aquifers of northern Arizona. Details of the study requirements will be addressed in the Substantive Policy Statement "Hydrologic Guidelines for Determining Assured and Adequate Water Supplies."

**Comment:** Commentator is concerned that the hydrologic complexity, sparseness of data, and the Department's lack of experience in northern regional aquifers has led to a far too conservative position at ADWR. It also appears that ADWR has very little confidence in the presence of regionally extensive or viable aquifers in northern Arizona. (Mike Ploughe, Town of Payson)

**Response:** The Department agrees that hydrologic complexity and data sparseness are significant issues in the regional aquifer systems of northern Arizona. However, the Department disagrees that its policies are far too conservative. The Department believes the policies formulated are commensurate with the level of knowledge and the importance of the determinations being made. The Department must make a determination that the proposed water is physically and continuously available for 100 years. Once the determination is made and a lot has been sold, the Department may not revoke the decision. The Department does recognize the existence of large regional aquifers in northern Arizona.

**Comment:** Several comments were received concerning the proposal to require large-scale geophysics in addition to aquifer testing. Most commentators considered the blanket requirement too costly for all applications; certain situations would warrant such explorations, but not all. (Brad Hill, City of Flagstaff; Mike Plough, Town of Payson; Deb Hill, Chair, Coconino County Board of Supervisors; Gary Small, Consultant, John Hoffmann, USGS; Ed McGavock, Consultant)

**Response:** The Department agrees. In the Substantive Policy Statement, "Hydrologic Guidelines for Determining Assured and Adequate Water Supplies," the Department will recommend using such geophysics only in those cases where it is warranted and will not require it in all cases. The applicants will be encouraged to discuss data needs with the Department prior to application and the conducting of field work. Depending on existing data and local complexity, the use of such geophysics may not be needed.

**Comment:** Several comments were received concerning the potential requirement of the use of specific down-hole logging techniques when installing wells. It was observed that in a great many cases the use of these techniques would provide valuable data. (Ed McGavock, Consultant; Deb Hill, Chair, Coconino County Board of Supervisors)

**Response:** The Department agrees that borehole logging techniques provide valuable data, both for the most efficient design and completion of the well and also for providing important information on local hydrogeologic conditions. In the Substantive Policy Statement, "Hydrologic Guidelines for Determining Assured and Adequate Water Supplies," the Department will recommend, but not require, the use of borehole geophysical and video logging techniques. Applicants are encouraged to discuss data needs with the Department prior to conducting field work or submitting an application.

**Comment:** Process for determining saturated thickness in areas with little data needs to be further explained; strict use of remaining saturated thickness may have issues related to the variability of storage capacity across the aquifer. (Deb Hill, Chair, Coconino County Board of Supervisors; John Hoffman USGS; Ed McGavock, Consultant)

**Response:** The total thickness of the C & R aquifer system may be estimated using regional data, if site-specific data or other local geophysical or drilling data are not available, or a combination of all the above. In recognition of the variability of storage capacity, the Department proposes the use of a numerically "weighted" saturated thickness to account for variations in the local aquifer units or sub-units. This will be accomplished by using a combination of saturated thickness and specific yield data for each geologic unit in the local aquifer system.

**Comment:** Need confirmation of an analytical model/water use criteria and "model" example. Conversations with ADWR staff indicated that smaller subdivisions (with demands of 100 acre-feet per year or less) will be allowed to use analytical models. (Deb Hill, Chair, Coconino County Board of Supervisors)

**Response:** Generally speaking, applications with demands of 100 acre-feet per year or less will likely be allowed to demonstrate physical availability using analytical models. However, in certain circumstances, conditions may warrant the use of numerical models in geologically complex areas or where the committed and current demands in an area approach 50% of the remaining weighted saturated thickness. All models (numerical and analytical) submitted to the Department are public information. Applicants may use that public information as an example or to expand upon where applicable.

**Comment:** Need an "example" numerical model and more clarity on model parameters. Need more detailed guidance on constructing a numerical model such as what cell size to use, number of model layers, and how a new model may be nested in a larger existing model.

**Response:** In the Substantive Policy Statement, "Hydrologic Guidelines for Determining Assured and Adequate Water Supplies," the Department will provide general guidelines in constructing an acceptable model. Generally speaking, widely accepted modeling techniques are expected. Specifics such as cell size, model layers, nesting, and aquifer parameters are all site-specific variables. The Department recommends pre-application meetings with its Hydrology staff to discuss the known parameters of the area and acceptable model construction. All models (numerical and analytical) submitted to the Department are public information. Applicants may use that public information as an example or to expand upon where applicable.

**Comment:** Account for recharge in modeling.

**Response:** The existing Substantive Policy Statement, "Hydrologic Guidelines for Determining Assured and Adequate Water Supplies," currently has a provision for inclusion of recharge in characterizing an aquifer. The Department has retained this item in the new revised the Substantive Policy Statement, "Hydrologic Guidelines for Determining Assured and Adequate Water Supplies."

**Comment:** Lack of specifics regarding ADWR's hydrologic study assistance for small subdivisions. Please clarify. (Deb Hill, Chair, Coconino County Board of Supervisors)

**Response:** When requested the Department currently conducts an initial hydrologic physical availability review for subdivisions of 20 lots or less. This review is based upon existing data the Department has on file. This is not a guarantee that in all cases the Department will have sufficient information to issue an adequate determination or a guarantee that existing information would support an adequate determination. The Department will expand this review for areas that adopt the adequacy requirement to include subdivisions of up to 30 lots. Again, this review is based upon existing data the Department has on file, and will not guarantee that sufficient information exists to demonstrate physical availability.

**Comment:** Please clarify that existing production wells may be used as observation/monitoring wells. (Deb Hill, Chair, Coconino County Board of Supervisors, Brad Hill, City of Flagstaff)

**Response:** The Department has stated previously and has clarified in the Substantive Policy Statement, "Hydrologic Guidelines for Determining Assured and Adequate Water Supplies," that existing production wells may be used as observation/monitoring wells when conducting aquifer tests or conducting long-term monitoring.

**Comment:** Proposed guidelines recommend one test well per square mile. While the reasoning is technically sound, the cost would be prohibitive for a large provider such as Flagstaff. This requirement if applied to the Red Gap Ranch owned by the City of Flagstaff would require 13 production wells be installed, at an estimated cost of over $15 million. (Brad Hill, City of Flagstaff)

**Response:** The Department will clarify in the Substantive Policy Statement, "Hydrologic Guidelines for Determining Assured and Adequate Water Supplies," that at least one well per square mile of pumping center (the actual area where production wells are to be located) should be installed. The Department does not intend to require one well per square mile of total service area, or one well per square mile of provider-owned property, such as the Red Gap Ranch area. Areas where sufficient data already exists may also reduce the number of new wells needed.

**Comment:** Commentator observes that several areas in the C and R aquifers contain poor water quality where the groundwater may contain high total dissolved solids and other naturally occurring elements, such as arsenic. It is also recommended that water quality testing be conducted as part of a hydrologic testing program, but what standards would be used? (Ed McGavock, Consultant)

**Response:** The Department agrees that water quality testing is a useful tool in a hydrologic testing program, but such sampling and testing is not required in the Substantive Policy Statement, "Hydrologic Guidelines for Determining Assured and Adequate Water Supplies." Under the assured and adequate water supply rules, water quality sampling and testing is only required for applications where the water service will not be provided by a water provider regulated by the Arizona Department of Environmental Quality (ADEQ) as a Public Drinking Water System (PDWS). ADEQ uses the United States Environmental Protection Agency's (EPA) definition of PDWS, which is systems that serve at least 15 connections or 25 people. For water providers who are regulated by ADEQ, the Department defers to ADEQ's on-going enforcement of the Safe Drinking Water Act (SDWA) as administered by the EPA. If the subdivision will not be served by a provider that qualifies as a PDWS (i.e., less than 15 lots or dry lot subdivisions) the Department requires a water quality test, and the standards used are the same SDWA standards used by ADEQ and the EPA.